

What is claimed is:

1. A device for measuring a position of a pointing member, comprising:
- a first oscillator including a first capacitive node having a first capacitance depending upon the position of the pointing member relative to the first capacitive node, the first oscillator generating a first signal having a first frequency depending upon the first capacitance;
 - a second oscillator including a second capacitive node having a second capacitance depending upon the position of the pointing member relative to the second capacitive node, the second oscillator generating a second signal having a second frequency depending upon the second capacitance; and
 - a frequency ratio determinator determining first and second characteristics associated with the first and second frequencies, respectively, and determining a ratio of the first and second characteristics.
2. The device of claim 1, wherein the frequency ratio determinator includes a counter configured to count a number of pulses in the first and second signals over a certain time interval in order to determine the first and second frequencies, the first characteristic being the number of pulses over the time interval in the first signal, the second characteristic being the number of pulses over the time interval in the second signal.

3. The device of claim 1, wherein the frequency ratio determinator is configured to measure the first and second frequencies directly, the first and second characteristics being the first and second frequencies, respectively.

4. The device of claim 1, wherein the first and second capacitive nodes each comprises a conductive plate.

5. The device of claim 1, wherein the first and second capacitive nodes each comprises an etched conductive tracing on a substrate.

6. The device of claim 2, wherein the first and second oscillators are each configured to be disabled while the other oscillator is enabled, and wherein the counter is configured to count the number of pulses in the first signal over a first time interval and the number of pulses in the second signal over a second non-overlapping time interval.

7. The device of claim 2, wherein the counter is configured to count the number of pulses in the first and second signals over a time interval that is substantially less than a period of ambient alternating current power.

8. The device of claim 2, wherein the measuring portion is further configured to determine a sum of the pulses counted from both the first and second signals, thereby allowing a pressure of the pointing member to be determined.

9. The device of claim 1, further including an interface configured to send data representing the ratio of the first and second frequencies to another device.

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10. The device of claim 1, wherein the first oscillator further includes a third capacitive node and the second oscillator further includes a fourth capacitive node, the first, second, third, and fourth capacitive nodes being interdigitated with each other.

11. A method for measuring a position of a pointing member, comprising the steps of:

determining a first capacitance of a first capacitive node, the first capacitance depending upon the position of the pointing member;

determining a second capacitance of a second capacitive node, the second capacitance depending upon the position of the pointing member; and

generating a first signal having a first frequency depending upon the first capacitance;

generating a second signal having a second frequency depending upon the second capacitance; and

determining a ratio corresponding to a ratio of the first and second frequencies, the position of the pointing member being indicated by the determined ratio.

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12. The method of claim 11, further including the step of counting a number of pulses over a certain time interval from each of the first and second signals, wherein the step of determining includes determining the ratio as being a ratio of the number of

pulses counted from the first signal and the number of pulses counted from the second signal.

13. The method of claim 12, wherein the step of counting includes counting the number of pulses of the first signal over a first time interval and counting the number of pulses of the second signal over a second non-overlapping time interval.

14. The method of claim 13, wherein the step of counting includes enabling a first oscillator that generates the first signal during the first time interval while disabling the second oscillator, and then disabling the first oscillator while enabling the second oscillator during the second time interval.

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(15.) A device for measuring a position of a pointing member, comprising:
a first capacitive node and a second capacitive node each commonly coupled to a first circuit node; and
a third capacitive node and a fourth capacitive node each commonly coupled to a second circuit node,
the first, second, third, and fourth capacitive nodes being disposed so as to be adjacent and interdigitated.

16. The device of claim 15, further including:
a fifth capacitive node and a sixth capacitive node each commonly coupled to the first circuit node; and

a seventh capacitive node and an eighth capacitive node each commonly coupled to the second circuit node,

the first, second, third, fourth, fifth, sixth, seventh, and eighth capacitive nodes being disposed so as to be interdigitated.

17. The device of claim 15, wherein the first, second, third, and fourth capacitive nodes each comprises an etched conductive tracing on a substrate.

18. The device of claim 15, wherein the first circuit node is part of a first oscillator and the second circuit node is part of a second oscillator, the first oscillator generating a first signal with a frequency depending upon a combined capacitance of the first and second capacitive nodes, the second oscillator generating a second signal with a frequency depending upon a combined capacitance of the third and fourth capacitive nodes.

19. The device of claim 15, wherein each of the first, second, third, and fourth capacitive nodes are triangular in shape.

20. The device of claim 15, wherein each of the first, second, third, and fourth capacitive nodes extend in an axial direction and are interdigitated with each other in the following order along a direction perpendicular to the axial direction: first capacitive node, then third capacitive node, then second capacitive node, then fourth capacitive node.

21. A device for measuring a position of a pointing member only in a single dimension, comprising:

a first capacitive node and a second capacitive node each commonly coupled to a first circuit node; and

a third capacitive node and a fourth capacitive node each commonly coupled to a second circuit node,

the first, second, third, and fourth capacitive nodes being disposed so as to be interdigitated.

22. The device of claim 21, further including:

an insulating material disposed over the first and second circuit nodes; and

a groove formed in the insulating material and running axially in an the single dimension.

23. A device for measuring a position of a pointing member, comprising:

a first capacitive node and a second capacitive node each commonly coupled to a first circuit node;

a third capacitive node and a fourth capacitive node each commonly coupled to a second circuit node,

the first, second, third, and fourth capacitive nodes being disposed so as to be interdigitated;

an insulating material disposed over the first and second circuit nodes; and

a groove formed in the insulating material and running axially in an axial direction, the first, second, third, and fourth capacitive nodes also extending in the axial direction.

24. A device for measuring a position of a pointing member, comprising:

a first oscillator including a first capacitive node, the first oscillator being configured to generate a first signal having a first characteristic depending upon the capacitance of the first capacitive node, the capacitance of the first node depending upon the position of the pointing member;

a second oscillator including a second capacitive node, the second oscillator being configured to generate a second signal having a second characteristic depending upon the capacitance of the second capacitive node, the capacitance of the first node depending upon the position of the pointing member; and

a processor configured to determine a ratio of the first and second characteristics.

25. The device of claim 24, further including an insulating material disposed over the first and second capacitive nodes.

26. The device of claim 25, wherein the insulating material has a groove running in an axial direction, the first and second capacitive nodes also extending in the axial direction.

27. A device for measuring a position of a pointing member, comprising:

a first capacitive node, a capacitance of the first capacitive node depending upon the position of the finger;

a second capacitive node, a capacitance of the second capacitive node depending upon the position of the finger;

an oscillator;

a switch coupled between the first capacitive node, the second capacitive node, and the oscillator, the switch being configured to connect either the first capacitive node or the second capacitive node with the oscillator, the oscillator being configured to generate a signal having a characteristic depending upon the capacitance of either the first capacitive node or the second capacitive node depending upon the switch; and

a frequency ratio determinator determining a ratio of the characteristics of the first and second signals.

28. A method for measuring a pressure of a pointing member, comprising the steps of:

determining a first capacitance of a first capacitive node, the first capacitance depending upon the position of the pointing member;

determining a second capacitance of a second capacitive node, the second capacitance depending upon the position of the pointing member; and

generating a first signal having a first frequency depending upon the first capacitance;

determining a sum corresponding to a sum of the first and second frequencies, the pressure of the pointing member being indicated by the determined sum.